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Signed

*P. Mahoney*

Dated

31 AUG 2000

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Patent Act 1977  
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# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

02 SEP 1999

Cardiff Road  
Newport  
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1. Your reference RRS/7269

2. Patent application number  
(The Patent Office will fill in this part)

9920623.7

3. Full name, address and postcode of the or of each applicant (underline all surnames)

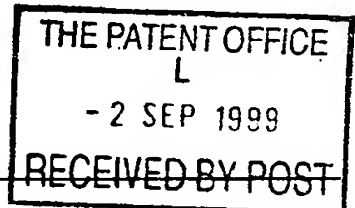
Biocomposites Limited  
Etruscan Street, Etruria, Stoke-on-Trent, Staffordshire, ST1 5PQ.

Patents ADP number (if you know it)

7402917001

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom



4. Title of the invention

Apparatus for Applying Surgical Devices

5. Name of your agent (if you have one)

Swindell & Pearson

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

48 Friar Gate,  
Derby DE1 1GY

Patents ADP number (if you know it)

00001578001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

YES

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

# Patents Form 1/77

9. Enter the number of sheets of any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 8

Claim(s)

Abstract

Drawing(s)

3 + 3



10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Swindell + Pearson  
Swindell & Pearson

Date 1/9/1999

12. Name and daytime telephone number of person to contact in the United Kingdom

Mr. R. R. Sales (01332) 367051

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### Apparatus for Applying Surgical Devices

The invention relates to an apparatus for applying surgical devices to a body, and particularly but not exclusively surgical devices such as pins or tacks.

One type of surgical device which may be in the form of a pin or tack, comprises a shaft which can be inserted into the body, with formations on the shaft to prevent removal or ejection thereof from the body. A head may be provided on the shaft.

In surgical procedures which use such a fixation device for closing meniscal lesions, there is usually a requirement for insertion tooling. The purpose of this tooling is to enable the surgeon to conveniently, accurately and effectively dispense one or a combination of soft tissue fixation devices to the surgical site. This procedure is often performed under arthroscopic control. A cannula is frequently employed. A fixation device is inserted into the cannula and an obturator is used to push the fixation device along the bore of the cannula to the proximal end of the cannula and into the meniscal soft tissue. A sharp needle may be used prior to insertion of the fixation device to prepare and form a track into the meniscus for the fixation device to penetrate. The procedure of inserting the tack into the cannula can be fiddly and time consuming for the surgeon. Usually insertion instrumentation requires withdrawal from the surgical site to enable further pre-loading with fixation devices prior to subsequent device insertion. The fixation devices are loaded manually into the cannula. This can lead to contamination of the fixation device which can then result in inflammation of the tissue.

According to the invention there is provided apparatus for applying surgical devices, the apparatus comprising device inserting means which includes guide means in the form of a passage along which a surgical device is moveable, the passage comprising in use inner and outer ends; and a supply means including means for holding one or more surgical devices, the supply

means being moveable relative to the inserting means such that in a first condition the supply means is aligned with the passage outer end such that a surgical device held by the supply means is moveable into the passage, and in a second condition the supply means is clear of the outer end allowing free access thereto.

The supply means may be releasably mountable on the inserting means. The supply means may be movably mountable on the inserting means, and may be rotatably or slidably mountable.

The inserting means may comprise a support member which may be manually engageable by a user. The support member may be provided at or adjacent the passage outer end. The supply means may be mountable on the support member.

The passage may extend through the support member.

The inner end of the passage may be shaped to aid positioning and may comprise one or more pointed parts.

The support member may include a pivot pin upon which the supply means is pivotally mountable, and desirably about a hole in the supply means. The support member may be generally in the form of a disc, and the pivot pin is preferably spaced from the disc axis. The supply means is preferably mountable on the support member so as to at least generally overlies the outer end of the passage.

One or more first holes may be provided in the supply means, in which first hole or holes a surgical device is wholly locatable, with the or each first hole selectively alignable with the outer end of the passage to permit transfer of the device into the passage. One or more second holes and/or recesses may be provided in the supply means through which second hole or holes or recesses free access is provided to the outer end of the passage.

Preferably a plurality of first holes are provided in the supply means. The first hole or holes may have substantially the same diameter as the internal diameter of the passage. The supply means may comprise a disc.

The supply means may be shaped to facilitate manual turning thereof. The supply means may comprise a plurality of lobes surrounding an axis, with a first hole provided in at least some of the lobes. At least some of the lobes may be spaced apart to define recesses therebetween.

In an alternative embodiment the supply means is slidably mountable on the support member. The support member may comprise a track along which the supply means is slidable.

The apparatus may also comprise a pushing means, engageable with a surgical device in the passage to push the device therealong. The pushing means may comprise an elongate member, which desirably slidably fits through the passage, and may have a handle part on one end. The elongate member may be flexible. The end of the pushing means engageable with a surgical device may be contoured, and may be concave.

The apparatus may also comprise an incision means extendible through the passage for creating an incision. The incision means preferably comprises an elongate member, with an incision formation at one end, and desirably a handle at the other end. The elongate member may be flexible.

According to a further aspect of the invention there is provided a method of applying a surgical device into a body, the method comprising using apparatus according to any of the preceding twelve paragraphs.

Preferably the surgical device is initially located in the supply means, and this may be before the supply means is mounted on the inserting means. A plurality of surgical devices may be mounted on the supply means.

An incision may initially be made in the body using an incision means as previously described, extending through the guide means. Whilst the incision means extends through the guide means, the holding means is preferably arranged such that a second hole or recess therein overlies the guide means, and through which said second hole or recess the incision means can freely extend.

Following incision, the incision means is preferably removed. The supply means is preferably moved until a surgical device held therein overlies the guide means. The device is preferably subsequently urged into the guide means and thereon subsequently into the body using a pushing means as hereinbefore defined.

Embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:-

Fig. 1 is a diagrammatic side view of part of apparatus for applying surgical devices according to the invention;

Fig. 2 is a diagrammatic side view of a further part of apparatus according to the invention;

Fig. 3 is a diagrammatic side view of a still further part of apparatus according to the invention;

Figs. 4 to 7 are respectively diagrammatic end views of different embodiments of a part of the invention;

Fig. 8 is a diagrammatic side view of the part of Fig. 4;

Fig. 9 is a diagrammatic end view of part of the apparatus of Fig. 1; and

Fig. 10 is a diagrammatic end view of part of a further embodiment of the invention.

The drawings show apparatus 10 for applying a surgical device such as a pin or tack into a body. The apparatus 10 comprises an inserting device 12 (Fig. 1) in the form of an elongate cylindrical passage 14 extendible into a body. The proximal end 16 is shaped to provide diametrically opposite points 18 to assist with location of the end 16 in a body.



A grippable part 20 is provided on the distal end 22 of the passage 14. The part 20 has a through hole 24 through which the distal end 22 extends such that the end 22 is clear and open. The part 20 has a generally D-shape, with the hole 24 towards the stem of the D. A mounting pin 26 is provided on the part 20 centrally aligned and further from the stem than the hole 24. The pin 26 points away from the proximal end 16.

The apparatus 10 also comprises a pushing member 28 or obturator. The member 28 comprises a solid elongate shaft 30 slidably extendible through the passage 14, and of a greater length thereof. The proximal end 32 of the shaft 30 is concave to help locate the end of a surgical device thereagainst. A handle 34 is provided on the distal end of the shaft 30 to define a generally T-shape configuration with the shaft 30.

The apparatus 10 further provides an incision member 36. The member 36 is similar to the pushing member 28 with a similar shaft 38 and handle 40. In contrast, at the proximal end 42 of the shaft 38, an incision part 44 is provided, which in this instance is an elongate blade. Other shape incision parts could be used as is required.

The apparatus 10 further comprises a holding member three examples 46, 48, 50 of which are shown in Figs. 4 and 8, Fig. 5, and Fig. 6. Each of the holding members 46, 48, 50 is in the form of a disc with a central hole 52 which is removably and rotatably locatable on the pin 26 to mount the holding member 46, 48, 50 on the inserting device 12. Each of the holding members 46, 48, 50 comprises a plurality of through holes 54 and one or more circumferentially open recesses 56. The holes 54 and recesses 56 are spaced from the central hole 52 so as to be alignable with the passage 14. The holding member 46 has three holes 54 and one recess 56, whilst the holding member 48 has two holes 54 and two recesses 56, and the holding member 50 has three holes 54 and three recesses 56.

Fig. 7 shows a further possible holding member 58. The holding member 58 comprises a central hole 52 surrounded by a core part 60, and from which part 60 four similar equispaced lobes 62 radially extend. A through hole 54 is provided substantially centrally in each lobe 62. The lobes 62 are sufficiently spaced from each other to define recesses 56 therebetween. The shape of the member 58 facilitates ready gripping and turning thereof.

The apparatus 10 can be used in the following manner. The holding member 46, 48, 50, 58 is loaded with appropriate surgical devices in the through holes 54. The thickness of the holding member 46, 48, 50, 58 is chosen such that an appropriate surgical device is wholly locatable without protuberance in the holes 54. The holding member 46, 48, 50, 58 can then be mounted on the pin 26, or can subsequently be mounted on the pin 26 during an operation. The inserting device 12 is inserted in an appropriate part of the body to extend to an area where surgery is required. The points 18 help to locate and retain the device 12 in this position. If the holding member 46, 48, 50, 58 is not already mounted on the device 12, this can be accomplished once the device 12 is in position.

An incision can then be made for receiving a surgical device. This is achieved by aligning a recess 56 in the holding member 46, 48, 50, 58 with the passage 14. The incision member 36 is then slid through the respective recess 56 and the passage 14 until the incision part 44 extends beyond the proximal end 16 to permit an incision to be made.

Once an incision is completed the incision member 36 is withdrawn. The holding member 46, 48, 50, 58 is then rotated until a one of the through holes 54 which bears a surgical device is aligned with the passage 14. The pushing member 28 is then used to push the surgical device from the holding member 46, 48, 50, 58 into the passage 14 and therealong to locate in the incision. Once the surgical device is located the pushing member 28 is removed. The provision of a number of through holes 54 in the holding member 46, 48, 50, 58 allows the apparatus 10 to be used for locating a further surgical device

without loading.

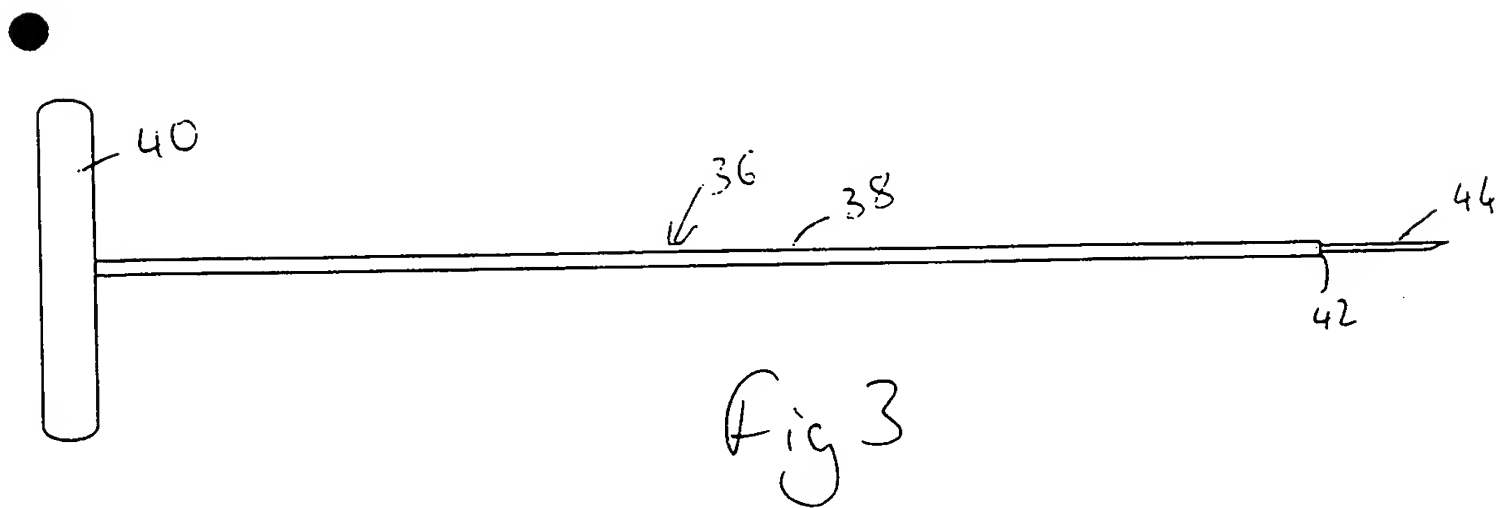
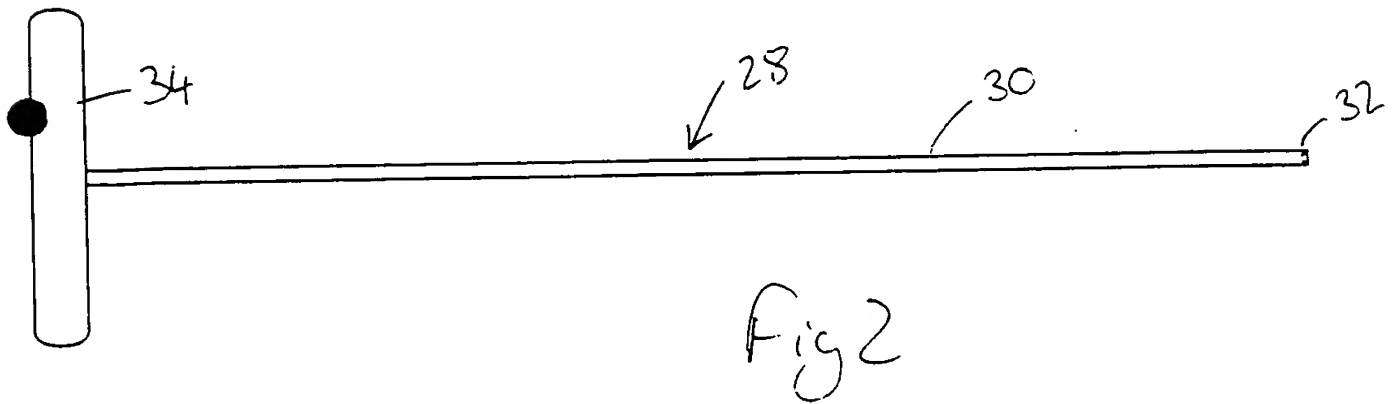
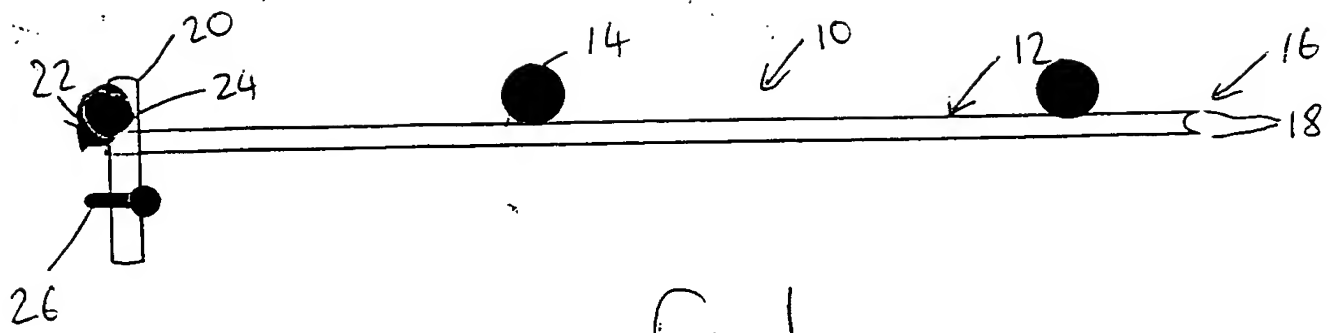
Fig. 10 shows a further arrangement of a grippable part 64 and a holding member 66. In this instance the part 64 is in the form of a disc with a central opening 68. A transverse track 70 is provided in a face of the part 64. The holding member 66 is elongate with rounded ends. Three equispaced through holes 72 are provided in the member 66. This arrangement can be used in a similar manner to that described above, with surgical devices wholly located in the holes 72. To insert a surgical device the member 66 is slid along the track until a filled hole 72 overlies the opening of 68. When it is required to use the incision member 36, an empty hole 72 would overlie the opening 68, or the member 66 would be slid clear of the opening 68.

There are thus described apparatus for applying surgical devices which provides a number of advantageous features. The holding members can be filled with surgical devices prior to any operation and in clean conditions. This greatly eases what can be a fiddly job and particularly in operating circumstances. The holding member permits a number of surgical devices to be applied with the same apparatus without pre-loading required. The provision of a recess or recesses on the holding member permits an incision to be made without any obstruction or inconvenience caused by the holding member. A different holding member perhaps including further or different surgical devices could be exchanged with one already on the apparatus, during an operation. The apparatus is of relatively simple construction and can thus be inexpensively and robustly manufactured in appropriate materials.

Various other modifications may be made without departing from the scope of the invention. The holding members may take many different forms, and rather than the recesses described may comprise further through holes through which the incision member can extend. The incision member may take many different forms. Other tools may be provided which can extend through the apparatus. The grippable part may have a different shape or form, and the holding members could be differently mounted thereon. The inserting device

may be curved rather than straight, as conditions require. The pushing member and/or incision member may be hollow and/or flexible, and particularly for use with a curved inserting device. The handles on the pushing member and/or incision member may have a different shape.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.



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Fig 4

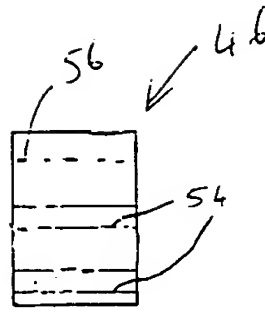
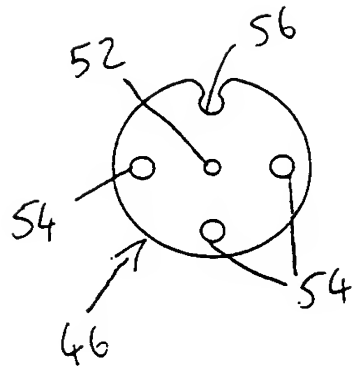


Fig 8

Fig 5

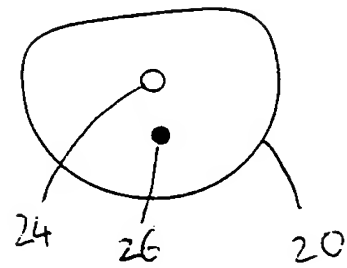
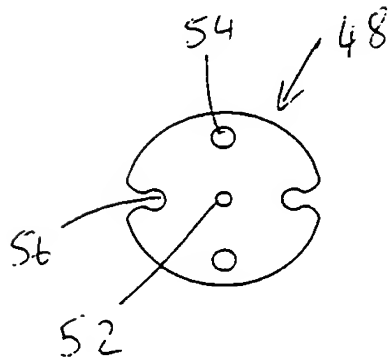
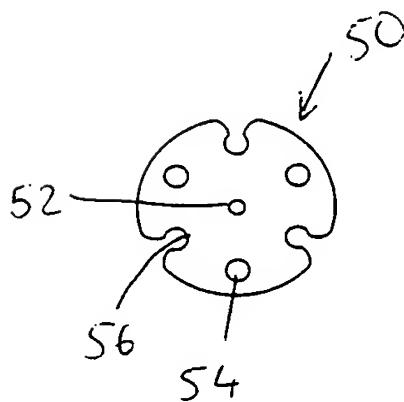


Fig 9

Fig 6



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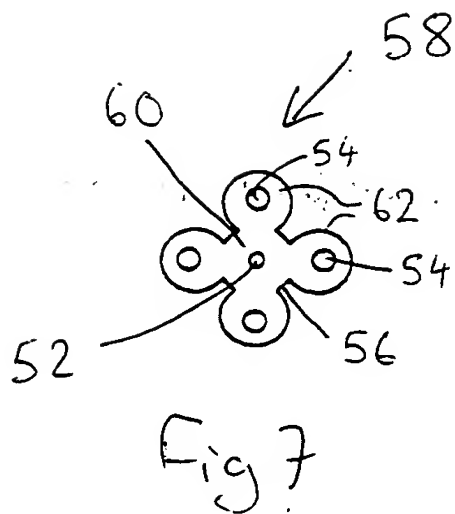


Fig 7

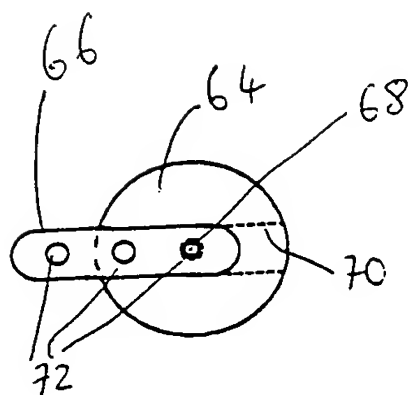


Fig 10

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Swindell Pearson

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